AVIATION

The Oldest American Aeronautical Magazine

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U. S. naval patrol flying boat PN7-2 (two 575 hp. Wright Typhoon engines) in flight

VOLUME XVII

NUMBER 20

SPECIAL FEATURES

TWO-PLACE LIGHT PLANES IN ENGLAND

DRIGGS-JOHNSON LIGHT PLANE DESCRIBED

THE 600 HP. SINGLE ENGINED FARMAN GOLIATH

RESULTS OF FRENCH TOURING PLANE COMPETITION

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AVIATION

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VOL. XVII NOVEMBER 17, 1924 No. 20

A Suggestion for the Winslow Bill

THE Winslow Bill for the federal regulation of civil aviation is now in process of revision. From many sides suggestions are being made with a view to modifying the measure and so obtaining the general approval of all aviation interests.

One of the inherent, and therefore most serious, objections to this Bill is that it creates—in the Department of Commerce—another government aeronautical bureau, and that it so would add another agency to the score or more that now control aerial activities in this country. The selection of the personnel required by the proposed Bureau of Civil Aeronautics is also a matter that causes anxiety. The aircraft inspection code that this Bureau would likewise adopt as a further guide for pilots now engaged in civilian flying.

As a substitute plan that has many arguments in its favor, AVIATION suggests that the licensing of civilian pilots and the registration and inspection of civilian aircraft be placed for the present under the Air Mail Service. This plan would avoid the creation of a new Government bureau. It would prevent further division of government air activities. It would dispense with the formation of a new staff of aircraft experts. So much for the things that would avoid overlapping and inefficiency.

The Air Mail has stations and employees from coast to coast. It is headed by a man in whom everyone has confidence. His staff knows airplanes and pilots. Its sound, common sense methods in airplane operation have earned it the general approval of the flying fraternity and the public. It has flying equipment some of which could readily be used for the functions of civilian aircraft supervision. If the Air Mail were intrusted with this work, there would be no doubt that it would issue licenses to pilots and aircraft on practical grounds rather than to satisfy a hair-splitting interpretation of the regulations. As the Air Mail's work is heaviest at the time of departure and arrival of the mail, the work of inspection and licensing could be fitted into its working schedule with but a fraction of the outlay that the proposed Bureau of Civil Aeronautics would require. At flying centers where the Air Mail has no stations, it could appoint resident aircraft inspectors from experienced local aeronautical talent, and the local post office would be their headquarters.

It will be seen from the above outline that the work of civilian aircraft supervision could be fitted into the Air Mail with a minimum of expense and with a maximum chance of success and general approval. Without going further into the advantages or possible drawbacks of such a plan, the suggestion is presented to our readers. It should be added that it is made without the consent or knowledge of the Air Mail officials. There seem to be so many points in favor of turning this very necessary function of civil aviation supervision over to the Air Mail that AVIATION proposes it as a solution of the controversial problems which the Winslow Bill now embodies.

The Contest Committee

THE excellent work of the N. A. A. Contest Committee at Detroit, St. Louis and Dayton justified the work of this important group and would make comment unnecessary were it not for the fact that a greater part of this praise is due Messrs. Shaw and Schorr who looked after the details. The selection of the personnel of the membership of the Contest Committee should receive due consideration so that any difficulties of the past may be overcome in the future.

The following information as to the way meets are handled by the Aero Club of France, which has the closest connection with the F. A. I., should be carefully studied to see whether our Contest Committee is following the best practice in its procedure.

"The Comité d'Aviation de l'Aéro-Club de France which controls meets is composed of forty-five members. The constructors are represented on it, having, I believe, about fifteen members. These constructors are members of la Chambre Syndicale des Constructeurs d'Avions. When a meet is to be arranged, a meeting is called of the Aviation Committee and the technical government representatives who discuss the method of procedure, rules and regulations. Over here, in France, they do not have one big meet and group everything into one meeting. There are a number of meets from time to time. This gives a steady influence for a continued and healthy competition."

Where the French system differs from ours is that in France they have representatives of the aircraft manufacturers at all meetings so that their opinions are considered before plans are made, and also that all the principal contests are not held in one place.

Handicap Airplane Races

IF handicap races are to become popular there must be more safeguards placed around the preliminary trials. In the races for civilian planes at Baltimore every other contestant except the winner made slower time than during the trials. Either the winner's speed was not correctly estimated, or else changes not contemplated when the trials took place were made before the race. Just what happened is not known, but the results should make the Contest Committee of the N. A. A. extremely careful in the future of the method of handicapping.

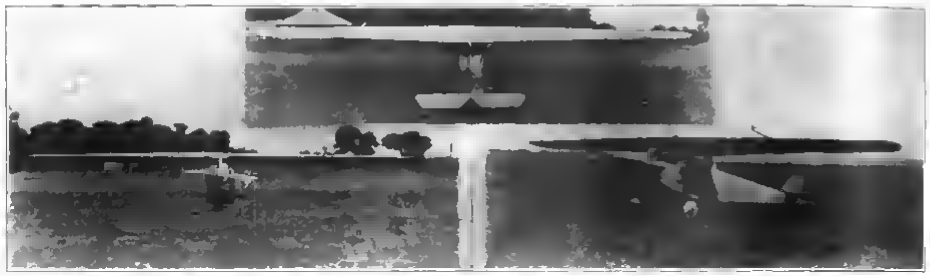
Trials should be run over the course to be used and race conditions duplicated as nearly as possible. As a further safeguard it is suggested that if a plane exceeds its handicap trial by ten per cent it should be automatically disqualified. Handicap races will become increasingly popular if they are handled judiciously, but not if the handicapping is subject to controversy.

The Driggs-Johnson Model DJ1 Light Plane

Efficient One-Place Monoplane Fitted with 4 Cylinder 80 cu. in. Motorcycle Engine Described

This light plane is one of the first planes of its type to be constructed in this country. It was built primarily for entry in the Dayton Daily News and Dayton Engineers' Club races held at Dayton, Oct. 3 and 4. The Johnson Airplane and Supply Co. being in close touch with commercial aviation in general also believes that this little ship will fill a very definite want for an airplane with low first cost and low upkeep.

The designer of the DJ1 Ivan H. Driggs, is an engineer of wide experience, having been formerly assistant chief engineer with the Dayton-Wright Co. under Col. V. E. Clark.



Three views of the Driggs-Johnson DJ1 one-place light plane (80 cu. in. 4 cyl. motorcycle engine) which won the Dayton Daily News Trophy race

Consequently this airplane cannot be considered an amateur job attempt. All construction work except motor was carried on in the shops of the Johnson Airplane and Supply Co., at Dayton.

Description

Fuselage—The fuselage structure is of welded steel tubing braced with Roebling wire. Aft of the cockpit the lines fair into a triangle with apex at top longeron. The cockpit is completely cowled in with celluloid to a perfect streamline, fairing into the triangle of the fuselage. The rear view gives a very clear idea of this construction.

Power Plant—The engine used is a four cylinder 80 cu. in. aircooled motorcycle motor of standard make. Thrust bearings and propeller hub extension were built onto the motor in place of the regular flywheel and flywheel housing. Cooling is accomplished by means of a scoop at the front under the motor, which forces air under the oil pan and then up the left side of the engine onto the exhaust and intake valve chests. The air is then drown across the engine from the left to right by suction louvers on the right hand side of the cowling. An air scoop is also provided at the front of cylinder No. 1 to aid in the circulation. Likewise, a small louver throws air to the top of each cylinder. The photographs give some idea of the cowling arrangement. The fuel tank is mounted in the leading edge of the wing, directly over the engine, providing an excellent feed by gravity to the carburetor.

Wing—The airfoil used is USA45. The wing is entirely internally braced, with 1/16 in. birch plywood covering for torsional stiffness. The spars are laminated spruce and unrouted. The spar width is graded outward from the root as the stresses decrease by leaving off successive laminations. The ribs use 1/16 in. Spanish cedar three-ply as webs, and 3/16 x 3/16 in. spruce battens nailed and glued to each side. Aft of the rear spar the ribs are covered with airplane linen, doped and varnished. The ailerons are constructed of welded steel tubing, fabric covered.

Empennage—The tail surfaces are of welded steel tubing, fabric covered. They are completely braced with Roebling wire.

Landing Gear—Two 450 x 80 mm. Palmer wheels are fitted. The construction is evident from the photographs. The single strut is of streamline steel tubing, the bracing Roebling wire.

Flying Qualities—No performance test has been run to date, so that accurate figures can not be given. The high speed is somewhat in excess of 85 mi./hr., as determined approximately by racing a Laird Swallow. The control is normal in every respect and although it is very light, the feel is perfectly satisfactory. The airplane flies very smoothly and gracefully, and does not give the pilot any feeling of insecurity such as so often is present in small airplanes.

During the race on Oct. 4, because of poor fuel, three forced landings were made in very rough and difficult country. The pilot, J. M. Johnson, was forced to land the first time in a newly plowed field, which he negotiated without mishap by side slipping to within a few feet of the ground before straightening out. At one time he was forced to take off in a meadow covered with weeds up to the center of the propeller. After getting off it was necessary for him to bank steeply around a number of trees before getting clear. In a wind the DJ1 is exceptionally easy and comfortable to fly. In bumps it is much better than a JN4 and absolutely no force is needed on the stick. A slight motion of the fingers or wrist is sufficient for control in the most severe weather.

Specifications

Wing area	70 sq. ft. total
Aileron area	7.56 sq. ft.
Wing span	27 ft.
Wing chord at root	44 in.
Wing chord at tip	32 in.
Mean chord	33 in.
Distance from C. G. to tail post	12 ft.
Distance from C. G. to tail post times mean chord	4.67
Area of rudder	2.4 sq. ft.
Area of fin	2.0 sq. ft.
Area of elevators	3.8 sq. ft.
Area of stabilizer	6.8 sq. ft. 11.7 total.
Engine 4 cylinder air-cooled	28 hp. at 3400 r.p.m. (2-11/16 in. bore x 3¼ in. stroke)
Propeller	4 ft. diameter

Weight Schedule

Wing Group		
Wing exclusive of ailerons	75.4 lb.	lb./sq. ft. 1.135
Ailerons	7.6 "	" " 1.00
Total wing group	83.4	1.11
Empennage		
Elevator	2.6 "	" " 0.70
Rudder	3.8 "	" " 0.66
Stabilizer	1.65 "	" " 0.68
Fin	1.4 "	" " 0.7
Total empennage	8.95 "	" " 0.765
Body group		
Fuselage 32.6 lb. Cowling	17.0 lb.	
Total body group	50.4 lb.	
Landing gear group		
Chassis 7 lb. wheels 16 lb., tail skid 1.25 lb.		
Total ldg. gear group	26.25 lb.	
Total structure	168.00 lb.	
Power plant		
Engine 127 lb. Propeller 5 lb. Ignition harness 0.75 lb. Gas tanks 3.2 lb. Gas pipes 2.5 lb. Oil pipes 0.25 lb. Engine controls 0.75 lb. Exhaust manifolds 1.0 lb.		
Total power plant	141.00 lb.	
Furnishings		
Floor 1.7 lb. Surface controls 1.6 lb. Instrument board 0.5 lb. Control cables 2.0 lb. Seat 5.2 lb. Cushions 2.0 lb. Safety belt 1.2 lb.		
Total furnishings	16.8 lb.	
Total aircraft empty	325.80	
Equipment	Instruments	4.0 lb.
Crew	Pilot	180.0 lb.
Fuel	6¾ gal.	23 lb.
Oil	1 gal.	8 lb.
Gross weight		510.85 lb.

French Touring Plane Cross Country Race

France encourages the development of civilian airplanes by a series of practical test and cross country flights, the winner of which gets substantial prize money. This year there have been held in France cross country flights for light planes, for multimotor transport planes, for smaller commercial planes and finally for tourist planes or, as we should call it, sport planes. The last named contest was managed by the Aero Club of France under the auspices of the French Secretary for Aeronautics who put up 100,000 francs in prizes.

The course was 1,320 mi. in length and comprised stops at seventeen different cities. Eleven days were allowed to complete the circuit, and a minimum speed of 45 mi./hr. must be made on each leg. The rules were somewhat complicated, but the main emphasis was put on reliability, secondary importance being put on speed and the number of passengers carried per horsepower. Planes were entered in different categories according to the horsepower required per occupant (pilot and passengers) carried. Thus if two ships should finish at the same speed, the more economical would get the higher score.

Twenty-three planes were entered, but seven did not receive the proper papers from the French technical service and so were eliminated. Of the sixteen planes which entered only one did not arrive at the finish, the elimination being due to carburetor trouble. Four machines received penalties for delays of one kind or another but the remaining eleven covered the whole circuit with absolute reliability. The weather on the whole was favorable and large crowds gathered at each of the landing places. As the machines were started at approximately the same time, they arrived pretty well together and this race-like aspect added great interest from the spectators point of view.

First place was won by a two-place Potez type VIII (80 hp. Anzani), piloted by Labouchère at a speed of 55 mi./hr. Second place went to a three place Morane-Saulnier type 50 (120 hp. Salmson) piloted by Fronval at a speed of 82 mi./hr. Third place went to a three-place Caudron type C127 (120 hp. Salmson) piloted by Patin at a speed of 63 mi./hr. There were five Potez planes entered, all fitted with Anzani engines and all five were present at the finish. Miss Boland, the only woman entrant, finished fifth. She flew a two-place Caudron type C27 fitted with an 80 hp. Rhône motor.

The Schreck (F.B.A.) amphibian fitted with an 180 hp. Hispano-Suiza finished eleventh. This machine is a very clean looking flying boat of the pusher type. The wheels are attached to the lower end of a V shaped bracing, the upper ends of which are attached at points approximating the wing hinges. There is no shock absorbing apparatus, but very large, softly inflated tires are used. The wheels when let down for landing fasten in to an axle which runs through the hull.

The only novelty in the motor line was the new Salmson AC9. Hitherto the Salmson Co. confined itself to radial water cooled engines. The AC9 is an air cooled nine cylinder radial which seems to have functioned well in the two machines to which it was fitted.

Inverted Aircraft Engines

Editor, AVIATION —

I note on page 937 of your issue of Sept. 1 reference to a claim for having made the first experiments with inverted aircraft engines. May I point out that in 1911 the French Gregoire firm built and sold a 40 hp. 4-cyl. inverted engine for airplanes which was used by several French pilots with fair success? Further, Mr. Handasyde of the Martinsyde Handasyde firm in 1910 turned his 8 cyl. J.A.P. air-cooled engine upside down in the single seater Martinsyde monoplane which was flown by the late D. G. Gilmour. This engine ran more satisfactorily upside down than it had ever been persuaded to run in its designed position.

You will see that experiments with upside down engines in Europe are of a considerable antiquity. Except in the case of some of the older air-cooled engines which depended very largely on an enormous oil consumption to maintain them at a reasonable temperature experience showed that trouble from oiled up plugs is not a serious one. In fact, provided that piston and scraper rings are in reasonably good condition, this trouble very rarely arises. The inverted engine has not been used to any extent in this country mainly because existing engines if they were installed upside down would be extremely inaccessible for inspection and overhaul.

W. H. SAYERS
Technical Editor, *The Aeroplane*
London, Sept. 11, 1924.

Two views of the DH4B fitted with an inverted type Liberty-12 engine. The success of this engine has prompted its adoption in the Loening Amphibian, a number of which are now under construction for the Army and Navy Air Services

The 600 hp. Single Engined Farman Goliath

New 600 hp. Farman Engine Replaces Twin Engine Arrangement In the Goliath Air Liner

When, toward the end of 1919, civil air transportation had its modest beginnings in the passenger and freight services instituted between Paris and London by French and British air lines, all but one of the types of planes used were converted war aircraft. The sole exception was the Farman Goliath 12-passenger transport which, though originally laid down as a bomber, had been turned into a passenger carrier while it was still in the design stage. Thus the Goliath was actually the first public air transport that was specifically designed for the requirements of passenger and freight carrying which was held that year, completing three 900 mi circuits without a breakdown in 34 hr at an average speed of 82 mi/hr, including all stops. The useful load carried on this journey was 2.2 tons, and the gross weight 11 tons. The high speed of the machine, at 6500 ft, was 100 mi./hr.

The four-engined, so-called "reinforced," Goliath was produced for the 1923 Air Transport Grand Prize of the French Air Department. The ship was equipped with 270 hp. Salmson engines which were mounted as tandem units in wing nacelles and which actuated tandem propellers. Although

The Farman "Goliath" 12-passenger transport (two 300 hp. Renault engines) used on the Paris-London airway

ing. The night bomber that was derived from it, and with which the French air force is now equipped, only appeared a few years later.

If adherence to an original type design proves—as numerous aircraft designers contend—essential soundness of design, then the Goliath must rank high among such accomplishments. For though a number of minor changes have been incorporated in this ship from the experience of five years' extended operation on the northern airways of France (to England, Belgium and Holland), basically the type has remained unaltered in constructional principles as well as in looks. A 1924 Goliath looks exactly like a 1919 Goliath, except for the cowling of the power plant which naturally varies with the type of engines employed.

The Multi Engined Types

Originally, the power plant of the Goliath consisted of two 260 hp. Salmson radial engines, driving tractor propellers. Later, in order to increase the speed of the ship—which was then about 85 mi/hr—two 300 hp. Renault 12 cyl. Vee type engines were substituted, and some of these ships were also fitted with 370 hp. Lorraine-Dietrich 12 cyl. Vee engines for experimental purposes. Although the twin-engined Goliath has remained the standard passenger-carrier on the French cross-Channel services, experimental three and four engined ships of this type have also been produced by the Farman factory.

In 1921 there appeared the three-engined type, fitted with 260 hp. Salmson engines, the third engine being mounted in the nose of the fuselage. The ship won—and was the only contestant to finish—the French Air Transport Competition accommodation had been provided for eighteen passengers in addition to a crew of three, the plane was only credited with a pay load of eight passengers and baggage owing to the large amount of special navigation and safety equipment imposed by the French Air Department for this competition. The ship won second prize, the winner being the Farman Jabiru cantilever monoplane.

The "reinforced" Goliath has a wing area of 1500 sq ft. and weighs 7084 lb empty, and 13,000 lb loaded. In the above mentioned competition the ship covered three circuits across country, aggregating 1200 mi in length, at a commercial speed of 75.8 mi/hr.

The latest alteration in the power plant of the Goliath consists in the suppression of the wing engines, and the substitution therefor of a single 600 hp. Farman model 18WD engine in the nose of the machine, with a single tractor propeller. As may be seen from the accompanying illustrations, the single-engined Goliath does not materially differ in looks from its multi-engined sisters. The suppression of the wing engines has naturally "cleaned up" the wing structure, but otherwise the latter is, except for minor variations in dimensions, identical with that of the twin-engined Goliath.

The 600 hp. Farman Engine

The Farman 18WD engine has a normal rating of 600 hp. at 1600 r.p.m. The maximum power, developed at 1800 r.p.m., is 720 hp. The engine is an 18 cylinder W type, with three banks of six cylinders set at an angle of 40 deg. The bore is 130 mm, the stroke is 180 mm and the cylinder capacity 43.3 liters. At its normal rating the gasoline consumption is 220 g/hp., and the oil consumption 10 g. A propeller reduction gear of 2.1 ratio is normally fitted, but this can be replaced by reduction gears giving 1.84:1, 1.67:1 and 1.5:1 ratios, or by a direct drive. The direct drive model weighs, dry, without oil, but with all accessories, 1716 lb. The 2:1 reduction gear model weighs 110 lb. more. In these figures the weight of the electric starter is not included; this weighs, together with the starting battery, which can also be employed for lighting the cabin, 110 lb.

Construction Details of Engine

Following are the main constructional features of the 600 hp. Farman engine. The cylinders are cast of steel in pairs and welded together. They are enclosed in a steel water jacket which is welded onto the cylinder blocks. The top of each cylinder is grooved to receive the cylinder head, which carries the four valve seats and plug threads.

The crankshaft is of the six-crank type, the cranks being set in pairs at 120 deg. The connecting rods consist of a master rod of I section and of two rods of tubular section which are articulated on the big end of the main rod. The pistons are aluminum alloy castings.

The valve gear comprises two camshafts which are located inside the upper part of the crankcase. One camshaft controls the valves of one cylinder row, and the other camshaft the valves of the other two rows. The valves are actuated by means of rocker arms and pushrods. Double ignition is provided by means of two magnetos and Delco ignition system.

Lubrication is effected by means of a gear pump which draws the oil from the tank and sends it to the crankshaft bearings, from where it is projected onto the small ends and into the cylinders. The oil returning to the crankcase is carried back by two other gear pumps into the oil tank. A fourth pump draws the oil just delivered into an oil radiator where it is cooled for further use.

Carburetion is by Zenith carburetors fitted with triple diffusers. There are two single and two double carburetors, each of them feeding three cylinders. The gasoline system is of the pressure type.

The water circulation system is of the centrifugal type, with gear pumps.

A Blumt electric starter of 24 volts, operating from a 1200 watt generator, forms the normal equipment of the engine.

Engine Compartment and Cabin

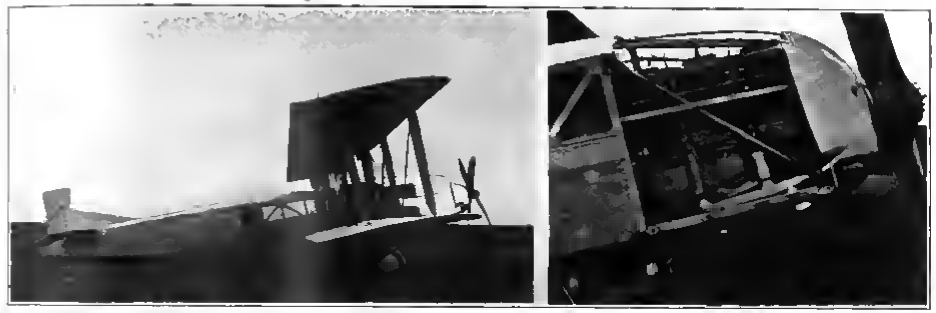
One of the accompanying illustrations shows the neat manner in which this big engine is mounted on the new Goliath. It would appear that four crossed steel tubes brace the engine to the fuselage, and that the whole engine mounting can be taken down by unscrewing a few nuts, and removing the corresponding bolts. The excellent accessibility of the engine compartment is a noteworthy point.

The cooling of the engine is effected by two Lamblin radiators which are suspended from the fuselage just ahead of the lower wing.

Owing to the mounting of the big engine in the nose of the fuselage, the internal arrangement of the cabin has been altered. The control cockpit, seating pilot and mechanic, is situated right behind the engine in such manner that the mechanic has direct access to the engine and can carry out minor adjustments in flight. A radio transmitting and receiving apparatus is contained in a sound proof compartment at the side of the mechanic, so the latter can act as a radio operator when he is not otherwise employed. The fuel supply, sufficient for 5 hr. flight, is stored in tanks placed behind the control cockpit, where a double fire proof bulkhead separates them from the passenger cabin. The latter accommodates eight passengers in comfortable armchairs, but two more can be carried on folding seats. A lavatory and a baggage hold are fitted aft of the cabin.

The landing gear is perhaps the most striking deviation from Farman practice for this general type of ship. The axle-less "trouser legs," cross-braced by wires, which were so characteristic of the previous types of Goliath, have been displaced by two wooden Vees which are joined by a streamlined cross-member. The two wheels are mounted on a divided axle, articulated in two points, and rubber sprung.

The fuselage, the wings and the tail unit are, with the exception of the fittings, entirely constructed of wood. Sheet aluminum is used for the covering of the engine compartment and the passenger cabin, but aft of the latter the fuselage is fabric covered, as are the wings and tail surfaces.



The new, single-engined Farman Goliath air transport. The close-up on the right side shows the mounting of the 600 hp. Farman 18WD engine and the Lamblin radiators

Performance Figures

Following are the characteristics of the 600 hp. single-engined Goliath:

CHARACTERISTICS OF THE 600 HP. FARMAN ENGINED GOLIATH

Span	88 ft.	Weight empty	6,600 lb.
Length	46 ft. 8 in.	Fuel and oil	1962 lb.
Height	17 ft. 4 in.	Crew (2)	352 lb.
Gap	8 ft. 9 in.	Passengers (8)	1408 lb.
Chord	9 ft. 11 in.	Miscellaneous	176 lb.
Wing area	1610 sq. ft.	Gross weight	9500 lb.
Total hp.	600	Cruising speed	100 mi./hr.

In flying trials, the ship being loaded with 4400 lb. of useful load as against 3300 lb. given in the above table, the high speed attained was 121 mi./hr., the minimum flying speed 60 mi./hr., and the take-off and landing speeds both 50 mi./hr. With this load the ship climbed 10,000 ft. in 21 min.

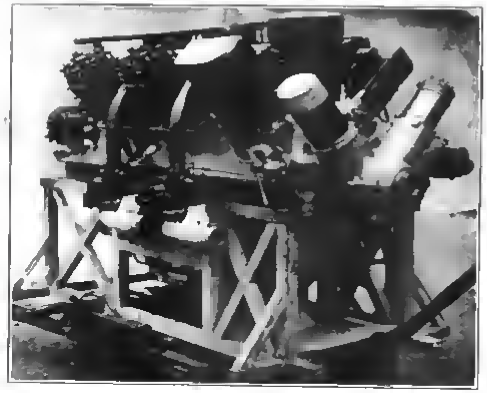
The remarkable weight carrying features of the 600 hp. Goliath are furthermore demonstrated by the fact that this ship holds the world altitude/weight records for 1600, 1500, 2000 and 3000 kg. The 1000 kg. record made May 6, 1924 by Lucien Coupet, is 18,868 ft., the record for both the 1500 and 2000 kg. records, made by Lucien Bossoutrot on May 8,

1924, is 14,682 ft., and the 3000 kg. record also made by Bossoutrot, on May 17, 1924, is 6371 ft. The previous records in these categories were made with the Barling Bomhar, which has four times the horsepower of the 600 hp. Goliath.

The present world duration record of 37 hr. 59 min. 10 sec. which Coupet and Drouhin established July 16-17, last, was made in a single-engined Goliath, known as type F62, which differs but slightly from the new passenger carrier described above.

The F62 Goliath

The F62 is equipped with a Farman 12WD engine, which is rated 400 hp. but develops 520 hp. at 2200 r.p.m. This engine is also a W type, but unlike the 600 hp. model, there are only twelve cylinders and these are set in three banks of four at 60 deg. The bore is 130 mm., the stroke 160 mm., and the cylinder capacity 25.4 liters. The fuel and oil consumption per horsepower hour is the same as for the 600 hp.



The 600 hp. Farman engine. On the right, the starting magneto; on the left, the alternator mounted on the generator.

model, and the same kind of propeller reduction gear is fitted. The weight of the engine, complete with all accessories is given as 500 kg. (1232 lb.)

The F62 has a span of 91 ft. 10 in. and a wing area of 1830 sq. ft. When the ship left the ground for its record breaking flight, it weighed 14,100 lb., giving a wing loading of 7.7 lb./sq. ft., and a power loading of 31.3 lb./hp. Despite this extraordinary high power loading the ship is said to have got off well and to have had a reasonably good climb.

The two pilots had originally planned to fly for at least 40 hr. and to make this possible, fuel tanks holding 4200 liters, sufficient for 42 hr. flying were mounted in the fuselage, where they took up most of the cabin space. However, during the flight a gale came up in the darkness, and made it difficult to keep close enough to the course for the necessary ground observation at the pylons. Therefore, when the two pilots were satisfied that they had amply broken the then existing world duration records for both refueled and un-refueled flying, they landed, having remained aloft 38 hr. but for a few seconds. This great flight proved among other things the wonderful reliability of the new 400 hp. Farman engine, of which this was the first public appearance.

Efficiency vs. Policy

It will be interesting to see whether the monomotor Goliath will supplant its twin-engined sister on the French cross-Channel services. On the sole score of all round efficiency there is no question as to the superiority of the single-engined ship. However, other factors will necessarily have to be taken into consideration in the choice.

First, it should be kept in mind that the Paris-London air way includes a 20-mi. stretch over water, where a twin-engined ship scores by reason of its ability to reach shore on one engine alone, provided it is flying at a sufficient height. In the second place, the Imperial Airways, Ltd. also employs twin-engined ships (Handley-Pages) on this service. Thirdly, there is a pretty general impression among the European airfaring public that twin-engined planes are safer than monomotors. Now, considering the intense rivalry that exists between the French and British air lines, it is easy to foresee what results the change of the French equipment from twin-engined ships to monomotors might have on the business prospects of the French air line.

Model Propeller Tests and Airfoil Theory

N.A.C.A. Report No. 196

The purpose of the investigation covered by the present report, by William F. Durand and E. P. Lesley, which was prepared for publication by the National Advisory Committee for Aeronautics, was the examination of the degree of approach which may be anticipated between laboratory tests on model airplane propellers and results computed by the airfoil theory, based on tests of airfoils representative of successive blade sections.

It is known that the corrections for angles of attack and for aspect ratio, speed and interference rest either on experimental data or on somewhat uncertain theoretical assumptions. The general situation as regards these four sets of corrections is far from satisfactory, and while it is recognized that occasion exists for the consideretion of such corrections, their determination in any given case is a matter of considerable uncertainty. There exists at the present time no theory generally accepted and sufficiently comprehensive to indicate the amount of such corrections, and the application to individual cases of the experimental data available is, at best, uncertain.

While the results of this first phase of the investigation are less positive than had been hoped might be the case, nevertheless the establishment of the general degree of approach between the two sets of results which might be anticipated on the basis of this simpler mode of application, seems in any event to have been desireble and to have abundantly justified the time and effort required.

A copy of Report No. 196 may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

National Air Policy

Editor, AVIATION:

In line with your desire to have the comments of AVIATION readers in your formulation of a desirable National Air Policy, I wish to make the following suggestions:

1. There should be a Government Bureau of Civilian Accident Statistics.

Discussion: Such a department might be a branch of the existing Army Air Service equivalent, and would be made effective by compulsory accident reports.

There are many influences, such as differences in utility, and in maintenance facilities, the inevitable low surplus power of certain sport and commercial types, etc., which render Air Service, or Mail Service Statistics of negative value in indicating civilian flying risks.

This Bureau, by study of each type of civil aviation, by the distribution of educational propaganda among fliers, and by recommendations which would serve as the basis of intelligent state and municipal laws, would perform an inestimable service in the advancement of American aviation.

2. There should be an Annual Safety Classification of Airplane Operators by a national agency similar in effect to the financial classification of business organizations by Dunn and Bradstreet.

WALTON GILBERT.

Attending the Dayton Air Races

Editor, AVIATION:

Before going into the sordid details of this manuscript, the proper thing to do would be to make known the fact that we are, as Mr. Grey of *The Aeroplane* writes, two of the common herd who graced the suburbs of Wilbur Wright Field during the recent Air Races held there. We are two young flying enthusiasts, who, from year to year, look forward to the coming Air Races. The events this year being not far from our fair city, was sufficient cause for us to draw our meager bank accounts with a resolve to see the Races at any cost.

We blithely set sail for Dayton on the second, filled with anticipation, for we had discussed nothing but the Pulitzer for the past two months. Upon reaching the field, the immensity of the thing was our chief source of wonder, for, in this vast prairie, were there not to be seen countless ships of new and interesting designs? At first, however, we were slightly puzzled by the aircraft, which were doubly conspicuous by their absence, though, by straining our optics, we could faintly discern the outlines of a plane or two in the hazy distance. Deciding in our ignorance, that we would take a look at the ships (also for the optimism of youth) we walked a mile or so nearer, when we were confronted by the austere front of a miniature army who informed us that the charge to see the planes was a dollar. Conforming to their request, we journeyed many more leagues until the ships were only separated from us by the infinitesimal distance of half a mile, when we were stopped and informed that we could go no further without a pass, which, of course, we were without, but asked where we could procure one. Upon being told that we should go to headquarters, at the other end of the field, we again set forth in mad search of the "Open Sesame" to the activities. When finally arriving near our goal we were again stopped (which by now held no terrors for us), told that no passes were to be had there, and told in no polite terms to be on our way. Despondent by these constant rebuffs, and a bit weary from our wanderings, we set about to go to the front of the field and view the proceedings from there. But there is no rest for the weary, it seems, for a bevy of Boy Scouts were jealously guarding the means of egress to the inviting boxes. This was the straw that broke the camel's back. Being stopped by Civilians, the Army and finally by the Boy Scouts proved too much for our fast ebbing vitality, so we resigned ourselves to our fate and thanks to the loud sprinklers and the starting bombs could determine whether or not the races were in progress. Occasionally the fast moving form of a TM would come across our vision, and we found that by standing upon our toes, we could sometimes see the racers round the pylon, a mere speck in the distance, but had no means of telling whether it was a Jenny or the Verville-Sperry (although we could, I will admit, recognize the TC5 when it soared overhead. The loud speakers raucously announced that the dot suspended from it was a Sperry Messenger, although we had to take his word for it.) Fortunately, we had the newspapers to refer to as to the happenings.

At about five o'clock, we traversed the length of the field, hoping that by now, the noble guards would be exhausted by their strenuous efforts of the day, and that we might actually gaze with unobstructed vision upon some ships at close range, which, from the day's experience, seemed impossible. The guards were still there, worse luck. However, we met Eddie Stinson with whom we talked for a few moments, and strengthened by that, walked brazenly past the guards! This sounds preposterous, I will admit, but nevertheless it is true. Luck which had eluded us all day, seemed at last to be with us, or so we thought, but as usual we were wrong. The sun which had shone gloriously all day, gave a dying glitter and sank below the horizon, leaving us to view the objects of our quest in an uncertain light, which grew more and more uncertain as time elapsed. Nothing daunted, with that indomitable spirit credited to young American manhood by the best novels of the day, we walked about in our murky paradise, peering here and there at grotesque shapes, which upon close observance, contoured into the familiar lines of an Avro or a Canuck, whichever the case may be. Losing ourselves two or three times, we eventually made our way back to the main road, pausing a few moments to rest our long suffering feet, cruelly abused by our many pilgrimages and, incidentally by the rats in the field.

The next day was a repetition of the first, plus a few more rebuffs. All in all, we had learned very little about aviation in Dayton, except for the fact that, in our humble opinions, the Army made a frightful mess of the International Air Races (and, by the way, why International?) and that for the success of the ones to come, it would undoubtedly be a better policy to hold them under the supervision of civilians, who would realize that the races are for the purpose of instruction to the "common herd" and not a private exhibition for a privileged few.

To tell the truth, we learned a great deal more from your own, Mr. Grey's and Mr. Warner's very vivid and excellent articles in AVIATION than from actual contact with the races. I wish that we could have the privilege of reading more articles in AVIATION by its editor, they being to the point, and above all, impartial to all walks in aeronautical life.

B. A. SHULTY, BILL WHITLOCK.
Cleveland, Ohio.

Purchase of Army-Navy Supplies

A radical departure will be made from the method of purchasing supplies for the military-naval establishment which has been observed for the past five years.

The act of July 11, 1919, required that in making these purchases in each instance a certificate should be placed on all money vouchers covering transactions in the following form: "Upon inquiry made, it was reported and found that the articles could not be purchased from any other branch of the Government or because of remote location or immediate needs it was not possible to obtain the articles from other services." This certification will be discontinued, the Comptroller General having issued instructions to the military division of the general accounting office as follows: "In view of the fact that five years have elapsed since the passage of the act of July 11, 1919, which required the securing of supplies from other Government departments where this was possible . . . and in view of the fact that the surplus stock of supplies and materials is reported to be practically exhausted, it is now considered unnecessary to insist upon furnishing such certificates."

This removal of a requirement which has been imposed during the long period of disposing of accumulated war material should have the effect, immediately, of adding to the volume of purchases of the various branches of the Government. This would be done, of course, in the regular way of open competition, after advertising for bids and award of contracts, except, obviously, in those instances where purchases are made by circular letter.

Air Navigation Maps

The following experimental air navigation maps, scale 1/500,000, have been compiled and reproduced by the engineer reproduction plant, Corps of Engineers, under the direction of the airways section, office of Chief of Air Service. These maps are now ready for issue:

Beaumont to San Antonio, Tex.
Bellefonte, Pa., to Cleveland, Ohio.
Chicago to St. Louis, Mo.
Cleveland, Ohio, to Chicago.
Dallas to San Antonio, Tex.
Dayton, Ohio, to Rantoul, Ill.
Dayton, Ohio, to Wheeling, W. Va.
El Paso, Tex., to Tucson, Ariz.
Kansas City, Mo., to Muskogee, Okla.
New York to Boston, Mass.
New York to Bellefonte, Pa.
Nogales and Tucson to Phoenix, Ariz.
San Antonio to Sanderson, Tex.
St. Louis to Kansas City, Mo.
Washington, D. C., to New York.
Washington, D. C., to Norfolk, Va.
Washington, D. C., to Wheeling, W. Va.

Distinguished Foreign Visitors

Among the distinguished English aviation visitors to this country recently were H P Folland, F R Ae S., M I Ae.E, M B F, chief engineer and designer of the Gloucester Aircraft Co., Ltd, and Capt. H S Broad, A F C, the British Speed King and famous war ace with many enemy ships to his credit. They are respectively the designer and pilot of the British entry for the Schneider Cup, the Gloster II seaplane, which through sheer bad luck was unable to compete, much to the deep regret of all aviation circles in this country The ship itself was specially designed for the race, and built in the Gloucester factory in five months Upon completion it was handed over to the capable hands of Captain Broad for testing, who after giving it a thorough test on the water, flew it for fifteen min, and although making a perfect landing, it suddenly turned over and sank When the ship was salvaged, a thorough investigation was made and it was found that a fitting attaching the port pontoon strut to the fuselage had broken due to a fracture in the material from which the fitting had been made and which was not discovered during the course of manufacture When asked his opinion of his mount Captain Broad stated, "The short experience I had of the Gloster II convinced me that had it not been for that unfortunate mishap we should have put up a very good show in the race."

After the crash, and the consequent cancellation of their entry Mr Folland and Captain Broad decided to make a personal visit to America with the object of meeting everyone connected with aviation, to see the Schneider Cup course, and to see under what conditions they would have to work should they send an entry next year During their visit they have been able to see the speed ships of this country and most of the aviation plants in the east.

"I cannot speak too highly," said Mr Folland during a pleasant visit to the offices of AVIATION the other day "of the courtesy with which both Captain Broad and myself have been received by the aircraft manufacturers and the committee of the Baltimore Flying Club We shall go back to England with pleasant memories of America's hospitality, and an anxious wish to return next year."

AVIATION feels certain to voice the sentiments of all aviation enthusiasts in wishing these spoeting gentlemen and the Gloocester Aircraft Co the very best of luck in 1925, and assuring them a real hearty welcome awaits them upon their return

Mr Folland's interest in aviation dates back to 1905, when he was experimenting with flapping wing planes, to the present time, during which he has designed and constructed thirty-one ships In 1911 he joined the British Aircraft Factory at Farnborough as assistant chief designer, being responsible for the first single-seater fighter with a 120 hp Gnôme motor in 1913, and later for the SE5, which, although produced in 1916, is still being used at the present time, both by many governments and commercial organizations, such as the Skywriting Corpn., both in America and Europe. In 1917 he joined the staff of the British Nieuport Co. as chief designer and engineer, producing among others, the Nieaport Nighthawk, the single seater fighter of the British Air Force at the time, and a twin engined bombar with 340 hp radial motors In 1921 he moved to the Gloucester Aircraft Co in the same capacity, designing first the Bamel (Mars I), which won the Aerial Derby of England at 164 2 mi /hr in 1921 afterwards being redesigned and winning the same race in 1922 at 186 mi /hr This same ship holds the present British Speed Record of 212 2 mi /hr and the record climb of 20,000 ft in 12 min In 1923 a new ship, the Gloster I, was produced and won the Aerial Derby for the third year's succession at a speed of 192 4 mi./hr Mr Folland's last effort before the illfated Gloster II, was the Grebe, now the steadard single-seater fighter of the British Air Force.

Captain Broad's flying career commenced in 1915, when he joined the Royal Naval Air Service, serving with the No 3 Naval Sqdn on the Somme, in France, until 1917, when he was wounded in air combat From this time until February, 1918, he was a fighting instructor, at which date he returned to France and continued his gallant work, for which he was awarded the Air Force Cross. In October 1918 he returned to England and finished the war with a Home Defense night flying squadron. Upon being released from the service, he joined the firm of A. V Roe & Co, coming to this country to fly Avro seaplanes in the Adirondacks. He returned to England in 1921 to become the chief test pilot of the De Haviland Aircraft Co, putting through their paces all the ships used on the British airways and many others. The Gloucester Aircraft Co have Captain Broad under contract to fly all their speed ships, with which he hopes to return next year and make a big bid for the much coveted Schneider Cup

Commerce Yearbook, 1923

The second annual issue of the Commerce Yearbook has just been issued by the Department of Commerce The Yearbook has been prepared in response to the demand of American business men, bankers, economists, and the trade press for an authoritative annual reference work upon economic progress throughout the world from the point of view of American industry and commerce

The aircraft industry is reviewed by the Aeronautical Chamber of Commerce, which estimated the capital invested in the industry proper, exclusive of materials, accessories, parts, and supplies, at $15,000,000 in 1923. There are fifteen plants which may be regarded as aircraft and aircraft-engine factories and their total production during the year was a little more than 200 airplanes. The trend of production since 1919 has been steadily downward in so far as military and naval equipment is concerned, and commercial construction is negligible. Exports and imports were very small

Commercial aviation as represented by operators flying war surplus airplanes was less active than in 1922 Between 1,200 and 1,500 machines were in service in 1923 and flew more than 3,000,000 mi., a much smaller mileage than that estimated for 1922 Regular services were operated, in season, between Cleveland and Detroit, Key West and Havana, New York and Newport, and New York and the White Mountains.

Commercial aviation as represented by the peace-time services to which aircraft were put by the Federal departments made distinct progress Among major accomplishments of the year were the illumination of the first night airway for the air mail—881 mi between Chicago and Cheyenne, forest patrol, agricultural projects, including reseeding fights and destruction of insect pests, and the utilization of aircraft by the Coast Guard in saving life and property at sea

New Airship Valve

A new type of Gammeter valve for lighter-than-air ships has been developed by J R Gammeter, of The B F Goodrich Rubber Co, to supplant the older types which were in use during the later years of the war and on lighter-than-air craft subsequently built.

The Goodrich Co, has announced that the new valve, which is a great deal more sensitive than anything previously designed for this purpose, is ready for production Although the new valve involves the same fundamental principle as the first Gammeter valve, mechanical difficulties, which prevented a maximum opening, have been overcome and the new valve provides a capacity discharge of 10,000 cu ft. per minute

The same L-shaped hp gasket, the heart of the gas valve has been retained for maintaining gas tightness and permitting the valve to function at a determined pressure setting. The type of gasket has proved its value and dependability in service through various styles of valves

Provisions are made in the spring adjusting mechanism on the new Gammeter valve to obtain the same loading at all pressure settings. This is essential to the accuracy of the valve in operation Friction in the new valve's working parts is reduced to a minimum through the use of ball bearings in the pivot points and by having the center beam ride in rockers.

The success of the new valve through its response to delicate fluctuations is due to its well balanced construction and the reduction of friction An increased pressure of 01 in H_2O is sufficient to operate the valve. The valve is constructed mainly from aluminum alloy

LIGHT PLANES AND GLIDERS

Edited by Edmund T. Allen

Two Seater Light Planes in France

At the Lympne competition recently held in England, dual control two-seaters with 64 cu. in. engines made speed ranges of 39 to 70 mi /hr and flew some 500 mi. each during the five days of the race.

The competition was held by the British government which offered £3,000 in prizes in an effort to develop a training machine which will be cheap to build, inexpensive to operate and simple to keep in repair The machines, illustrations of which are shown here, were not of unique general design Nor was their structure unusual. It was, in one sense the maximum achievement which present types have shown There were nine biplanes and seven monoplanes; a very good opportunity to compare the advantages of these two ideas in design

The Entries

The Beardmore "Wee Bee" and the Bristol "Brownie," which took first and second prizes of £2,000 and £1,000 respectively were both monoplanes. Two Hawker biplanes came in third and fourth in number of points. The Parnall "Pixie" convertible mono-biplane took fifth place, a side by side biplane, the product of the Cranwell Light Plane Club took sixth, and the Westland "Wood Pigeon" biplane came seventh

Engine idiosyncracies played a large part in the meet, eliminating some machines that might easily, on a performance basis, have won prizes Notable among these were the new A.N.E.C. monoplane, a machine very similar in general form to the Beardmore, and, in fact, designed by the same engineer, Mr Shackleton The Avro "Avis," a very neat and light biplane, was eliminated by engine trouble The Supermarine "Sparrow," also a biplane of trim appearance, and the Short "Satellite," an all metal cantilever monoplane, were put out of the running (or rather, the flying) by obstinate engines early in the race

The engines used were the Bristol "Cherub," a 1100 c.c. (64 cu. in.) two-cylinder opposed, the Anzani 3 cylinder radial of the same displacement; the A.B.C Scorpion, a two cylinder opposed; and the Blackburne 1,096 c.c three cylinder radial

The Power Plants

The Bristol Cherub develops 32 b.hp at 3200 r.p.m. It is suggested as used on the Beardmore, but a geared model was also provided The Cherub is rated at 24 b.hp. at 2500 r.p.m. at which speed it is supposed to be run. It has a brake mean effective pressure of 121 lb /sq in. and weighs complete with carburetor, magneto, propeller hub, and bolts 86 lb. Its fuel consumption at 2/3 hp was 0 625 pints per hp hr At full power (32.8 hp. at 3200 r.p.m.) it was 0.582 pints per hp hr This engine was given a 25 hr. endurance run of which 10 hr were non-stop It performed quite satisfactorily on this test, but in the ships at the Lympne competition the geared engines gave out before the end of the meet, and of the ungeared models about half had engine trouble of a serious nature In spite of this, the Bristol Cherub showed up well among the winners, seven of the eight prizes presented at the three prize events going to Cherub engined machines

The Anzani engine was used in two machines, with two others in which it could be substituted for the Cherub The former two were the A.N.E.C designed by Mr. Shackleton, and one of the Hawker biplanes. The A.N.E.C was eliminated in the elimination trials by engine trouble, but the engine in the Hawker biplane carried it through to fourth place. The Anzani is a two-cylinder Vee type engine, and is mounted in the inverted position like the Blackburne of last year The inverted position is much to be desired, both because of the improved pilot's vision made possible by getting the cylinders out of the way, and by the aerodynamic advantage of raising the thrust line.

The A.B.C. "Scorpion" was fitted in the other Hawker biplane, which took third place. This engine is a horizontal opposed of the same type as the Cherub It fits very neatly in the nose of the Hawker, and during the competition seemed to give good results except for the thrust race running hot, which necessitated installing a new engine, and a rocker arm breaking on the new one just before the end of the contest, resulting in Raynam's losing the first prize and dropping down to third.

One other type of engine was used in this competition. the Blackburne. It was installed in several of the entering machines, but carried only one through to the end. This was the Parnall "Pixie." The Blackburne was the engine which was considered most successful in last year's competition This was, however, the 45 cu in. engine This year's engine is a 64 cu in. type designed especially for the two-seater competition

Engines Still Undeveloped

The great disappointment of the meet was that the engines were as a whole still undeveloped It was the exceptions which carried through to the finish. Time after time, excellent machines were forced to abandon the effort because of persistent engine failure. Even the Bristol Cherub which on the surface looked as if it swept the boards clean on prize money, failed in as many places as it succeeded It is generally admitted that another year's development will produce a superior product, an engine that will run for its full quota of hours without breaking down Too often the general engine failure is condoned on the basis of the argument that this "terrific load" is too great for an engine to withstand The fact is, however, that we have no really good small engines—finished products, on which a proper amount of development work has been put Engine manufacturers cannot afford to put the experimental work on these engines which is put on those selling for thousands of dollars—if not pounds. And so they are put out—"good enough at the price we can get for them."

The light plane trials did not surely put any greater stress on the small motors than is put on aeronautical motors in racers or high duty service machines. Those who witnessed the Mitchell Trophy Race at Dayton, must have been impressed by the astonishing and persistent regularity with which the Curtiss Pursuits passed the pylons in the order of their numbers, the motors purring out their maximum power with never a hint of trouble In at least one case the motor had had over 125 hr. flying under hard service conditions since its last overhaul, and during that time had had nothing done to it except spark plug changes. These motors were running at fully as high mean effective pressures, higher compression ratios, with higher inertia effects and much higher bearing pressures than any of the light plane engines which we used or attempted to use Their fuel consumption per b.hp was much lower and their weight power ratio very much below that of the smaller engines. The Curtiss D12, the Liberty, Napier, and OX5 have had their development work done at government expense. The only alternative to this in the light plane field—since the government is not at present likely to buy light planes in large quantities—is either an intense interest on the part of an engine manufacturer who can afford to put out a really superior product, or else the natural development that comes with large production

For the immediate future, however, we must answer the question why demand a larger engine for light planes merely because the smaller ones are imperfect. There are no well

developed engines in the slightly larger sizes. And construction of both the efficient plane and engine becomes more involved and difficult as the size is increased. Whatever the reason for the unsatisfactory engine situation, the demand for greater engines is certainly making itself felt. The Editor of *The Aeroplane* says in the Oct. 8 issue, "It has been very generally held that the primary fault with the rules was the setting of the limit of engine capacity as low as 1,100 c.c. But one is far from believing in the future of the 1,100 or even the 1,500 c.c. engine. The essential feature of the practical light aeroplane is that it should be small, light and cheap, and require only a moderate engine power to fly it. Provided it complies with these requisites, it really does not matter whether it has an engine of 400 c.c. or of 4 liters. Frankly, one is fairly firmly convinced that if the light aeroplane is to be of any use at all it must be fitted with an engine having a large bore and stroke, a low compression ratio, and running at a low speed. There is no reason why such an engine should not be built for very little more weight, and probably for less cost than the present high-duty type. Personally for a two-seater one would choose if it were possible a 2,000 c.c. engine developing about 40 hp. at 1700 or 1800 r.p.m."

What Is a Light Plane?

The Editor of *Flight* remarks in the same vein, "Into the question of future engine capacity we do not wish to enter at the moment beyond pointing out that two ways appear to be open. One is to go on developing the 1,100 c.c. high-speed engine until reliability combined with low weight and high power is attained. Another is to go for the larger engine, say, 2,000 c.c. and to limit the piston speed. The problem is very complicated, and very good arguments can be put up for either course."

The attitude of the French is well known. Last year they raised the limit of light plane engines to 3,000 c.c. for two-seaters and 2,000 c.c. for single seaters. They are developing a different type of product, the sport plane, very useful and desirable in its field, but bordering on the line of those machines which can no longer be called light planes.

All this seems to indicate a lack of clearness as to the objective of light plane development. What is the difference between a Curtiss JN4D with its 90 hp. carrying two passengers, and a single-senter so-called light plane with a 40 hp. motor? What then can be said of the new Laird Commercial or the neat little Swallows with their four seats and the 100 hp. OXX6 motor? The Swallow is more of a light plane than some of the French single seaters. Where are we going with our light planes? Is the inevitable end to be a merging of the types and a loss of identity of the light plane as such?

The Official Results

The following are the official figures of the performances achieved by the non-eliminated competitors in the course of the tests.

Beardmore Wee Bee I: No. 4. Pilot M. W. Piercey. High speed 71.11 m./hr. Low speed 39.66 m./hr. Speed range 76.77 per cent.* Get-off 235 yd. Pull-up 124 yd. Hours flown 11 hr. 54 min. Miles flown 737.5. 1st Air Ministry prize £2,000.

Bristol Brownie: No. 1. Pilot C. F. Uwins. High speed 65.19 m./hr. Low speed 38.73. Speed range 68.33 per cent.* Get-off 215 yd. Pull-up 102.6 yd. Hours flown 10 hr. 23 min. Miles flown 512.5. 2nd Air Ministry prize £1,000, Duke of Sutherland's prize £500 for Get-off and Pull-up.

Hawker Cygnet: No. 15. Pilot F. P. Raynham. Low speed 37.42 m./hr. Get-off 250 yd. Pull-up 72.66 yd. Hours flown 10 hr. 29 min. Capt. C. B. Wilson prize £100 for Get-off and Pull-up.

Cranwell C.J. A.2: No. 3. Pilot Flt. Lieutenant Cooper. Hours flown 17 hr. 53 min. Miles flown 762.5. S.M.M.T. prize £150 and B.C.M.C.M.T. prize £150 for maximum distance flown.

Hawker Cygnet: No. 14. Pilot Sq.-Leader Longton. Low speed 37.42 m./hr. Get-off 250 yd. Pull-up 72.66 yd. Hours flown 8 hr. 24 min. Miles flown 400.

Parnall Puxe III: No. 19. Pilot Sq. Ldr. Sholto Douglas. Low speed 37.22 m./hr. Get-off 301 yd. Pull-up 70 yd. Hours flown 10 hr. 4 min. Miles flown 450.

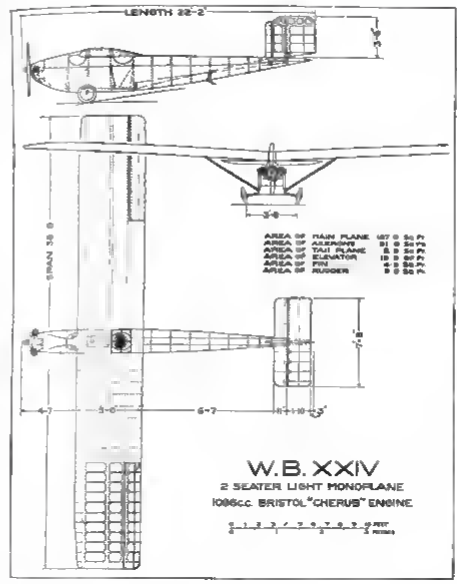
Westland Wood Pigeon: No. 5. Pilot S. H. Gaskell. Hours flown 2 hr. 31 min. Miles flown 125.

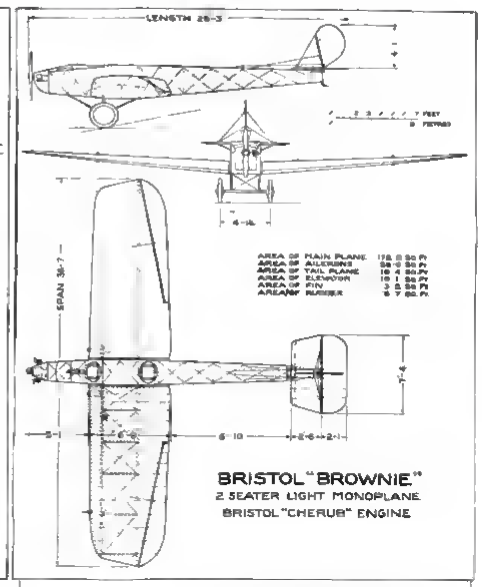
We are indebted to *Flight* for the outline drawings of some of the new English light planes that appear on the opposite page. Another page, illustrating four light biplanes will be published in our next issue.

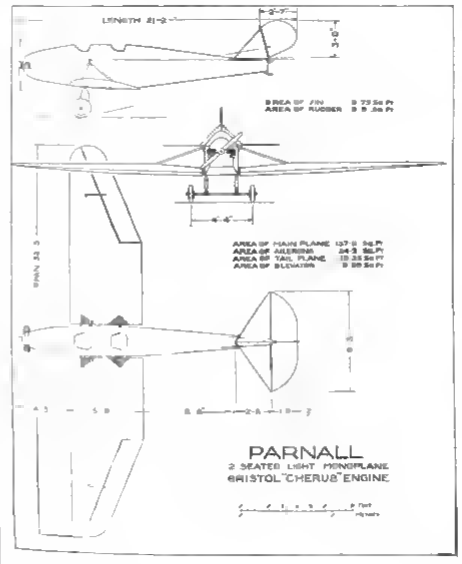
*Speed range $= \frac{\text{high speed} - \text{low speed}}{\text{low speed}} \times 100$

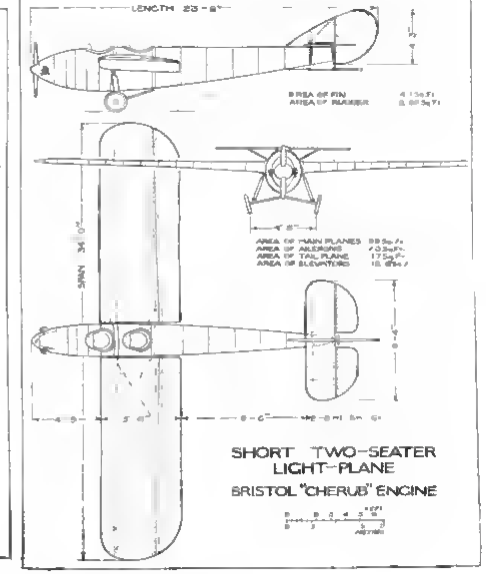
Specifications of the Light Planes Entered in the Lympne Meet

Entrant	Entry No.	Pilot	Type and Name	Engine	Span	Length	Folded Dimensions Span	Length	Height	Wing area sq. ft.	Weight empty lb.	Weight loaded lb.	Wing loading lb./sq. ft.	Power loading lb./hp.	Est. Speed range m.p.h.	Remarks
Bristol Aeroplane Co. Ltd.	1	Uwins	Monoplane 'Brownie'	Cherub	30′0″	20′0″	7′4″	20′0″	8″	204	500	870	4.26	29.0	56-70	Steel Fuselage
Bristol Aeroplane Co. Ltd.	2	Barnwall F/Lt.	Monoplane Brownie	Cherub	34′7″	18′3″	7′4″	23′3″	8″	192	500	870	4.52	29.0	56-70	Steel Fuselage and Wing Spars Side by Side Seats
Cranwell Light Aeroplane Club	3	Compos	Biplane	Cherub	26′6″ (T) 22′6″ (B)	21′6″	8′6″	23′6″	8′ 0″	238	518	860	4.74	29.8	—	—
Wm. Beardmore and Co. Ltd.	4	Piercy	Monoplane Wee Bee	Cherub	30′0″	22′2″	7′8″	22′2″	8″	6′ 0″	187	462	837	4.47	35.8	36-46	—
Westland Aircraft Works	5	Winscanley	Biplane Wood Pigeon	Cherub or Anzani	25′6″	19′8″	7′8″	19′8″	8″	6′ 0″	175	433 or 464	776 or 804	3.97 or 4.18	86 or 24	33-72	Alternative Engines
Westland Aircraft Works	6	Gaskell	Monoplane Widgeon	Cherub or Anzani	30′8″	21′0″	8′6″	32′0″	8″	7′ 0″	145	450 or 475	780 or 815	5.45 or 5.62	26.3 or 24	42-72	Alternative Engines
Air Navigation & Engineering Co. Ltd.	7	James	Monoplane	Anzani	38′0″	16′8″	7′5″	20′8″	8″	6′ 0″	185	415	730	3.94	24.3	35-85	—
Short Bros. Ltd.	8	Parker	Monoplane	Cherub	34′0″	23′9″	—	—	—	—	168	483	650	5.05	26.2	37.73	All Metal Fuselage
Supermarine Aviation Works Ltd.	9	Biard	Biplane Sparrow	Blackburne Ra bal	31′0″ (T) 27′0″ (B)	21′4″	8′5″	23′8″	8″	2″	256	473	660	3.28	28.6	—	—
A. V. Roe & Co. Ltd.	10 11	Hinkler	Biplane 'Avis'	{Cherub / Blackburne / Radial}	30′0″	24′0″	8′0″	24′0″	8′	11″	253	450	816	3.20	27.0	39-75	One machine entered with two different engines
Blackburn Aeroplane & Motor Co. Ltd.	12	Lotan	Biplane Blue Bird	Blackburne Radial	18′0″	21′8″	8′8″	21′8″	8″	7′11″	243	485	875	3.80	29.2	33-74	Side by Side Seats
F. K. Raine	13	—	Monoplane	—	18′0″	21′8″	—	—	—	—	176	—	710	4.05	23.8	38-83	Scratched
H. G. Hawker Eng. Co. Ltd.	14	Raynham S/L.	Biplane	A.B.C. Scorpion	28′0″ (T) 23′0″ (B)	20′5″	8′0″	20′6″	8′	10″	165	372	780	—	—	—	—
H. G. Hawker Eng. Co. Ltd.	15	Langlan	Biplane	Anzani	do	do	do			do	173	730	—	—	—	—	—
Vickers Ltd.	16	Paye S/L.	Biplane	Cherub or Blackburne	28′0″	22′0″	10′0″	22′0″	8′	5″	224	827	887	3.85	30.8	33-74	—
Geo. Parnall & Co. Ltd.	17	Douglas	Monoplane Pixie III	Cherub	32′4″	21′3″	8′8″	23′8″	6′	10″	140	—	—	—	—	—	—
Geo. Parnall & Co. Ltd.	18	F/Lt. Haig	Biplane Pixie III a	Cherub	25′8″ (T) 32′4″ (B)	21′8″	—	—	—	—	243	—	—	—	—	—	Pixie III plus Top Wing









Courtesy *Flight* (London).

AIRPORTS AND AIRWAYS

Long Island News

The Sikorski twin-engined passenger carrier has been going through a most successful series of test flights with its two new Liberty motors at Roosevelt Field. The machine flies well on one motor and the rate of climb on the two motors is very good. A description of this machine will be given in a forthcoming number.

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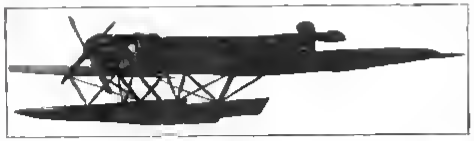
A new comer at the Curtiss Field is the Heinkel corps observation machine fitted with a 450 hp. Napier Lion engine. Herr Ernst Heinkel was originally with the Caspar firm of Germany, and has always specialized in quickly demonntable machines. In 1922 he started a firm of his own known as the Ernst Heinkel Flugzeugwerks at Warne munde, Germany.



Heinkel S1 seaplane on which Lieut. Craake of the Swedish navy made a new weight/altitude record carrying 300 kg. to 20,000 ft.

His HE3 could be changed from a land machine to a seaplane in 65 sec. by a crew of six men. Herr Heinkel made arrangements with the Svenska Aero A. B. of Stockholm, Sweden, for the use of his patents and designs, and the construction of machines which could not be built in Germany on account of the treaty regulations. The new corps observation machine is a result of this arrangement. It is said that it will be entered by Mr. Cox of the Cox Klemin Co. in the forthcoming trials of corps observation planes at McCook Field.

The machine is a biplane with very pronounced stagger. There are no interplane wires the wings being connected only by a solid I strut. The machine is of very clean design and those who saw it fly said that it behaved excellently. Herr Heinkel and his associates do not speak English. The other day they went to the hangar and found that the machine had disappeared. They naturally thought that it had been stolen and nobody could tell them that it had been flown over to Mitchel Field. The excitement lasted for some time.

Mr. Gilmore of the Curtiss Co. has been doing considerable flying in his amphibian. It looks a little like a "daddy long legs" but performs very creditably. He flew it down to the Baltimore meet.

The Balsams Service have finished a very successful season flying and are now overhauling their ships.

Capt. Charles Nangesser, the French ace, has brought up his Hanriot HD1 and his Nieuport 18 meter fighters from Cuba, which in addition to his Potez Sport plane with Anzani motor, now gives him three ships to operate with. He recently gave an exhibition of aerial fighting at Philadelphia and is now engaged in doing work for the movies.

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The Curtiss Metropolitan Co. of Port Washington have purchased the latest model Loening Air Yacht. The wings are of slightly larger area and have a different wing curve. The hull has been considerably strengthened up and the cabin has been somewhat enlarged. The machine will be used this winter at Palm Beach. Fred Golder, manager of the company, says that the winter residents of Palm Beach find an MF flying boat too slow, they want something that will get them there in a hurry. Incidentally the new job is certainly a fine looking machine and gives an impression of great solidity.

Harry Rogers has sold his Loening air yacht in Canada. He had expected to use it in Florida, but he had a good offer for the ship and changed his mind. The flight from Port Washington to Montreal was made in three hours.

C. B. Harmon Offers Trophy

Clifford B. Harmon, one of the oldest living American aviators and a former member of the Lafayette Escadrille, has offered to the French Army Air Service, in memory of the famous American volunteer flying squadron, a trophy of the value of 20,000 francs, to be competed for by active French army aviators under official auspices.

Smaller trophies and cash prizes to the value of 10,000 francs will be distributed each year among the contestants. The competition for the Harmon Trophy will take place annually in France during five years. The regulations are now being considered by the French War Minister and the "Vieilles Tiges," an association composed of French aviators who obtained their pilot's certificate prior to the war of 1914-18. ("Vielle Tige" means, as far as it can be translated into English, "Old Timer.")

When the details of this competition will have been settled, it is Mr. Harmon's intention to put up similar trophies in other countries, in particular the United States, Great Britain and Italy. In addition to these trophies, Mr. Harmon proposes to offer a handsome international aviation trophy which would be competed for in the various countries above mentioned.

Chicago News

The Heath airport, north of the North Shore polo field, is officially closed, after eight years of aviation activity, with no fatal accidents. For the present, the dozen planes have migrated to the Morton Grove airport until a larger field may be obtained.

Thirty acres, eight years ago meant much to Nimmo Black, when he opened what this summer was named the Heath airport. There was an old haystack, behind which he sheltered his only airplane, until he erected a hangar a few years later. Now the three-story apartment buildings, the telephone lines and light wires have made the little thirty acres hard for an airplane to approach safely.

According to Otto Klein, of the Heath Airplane Co., in eight years 100,000 mi. have been flown by airplanes from the airport. Last summer 750 persons took airplane rides from this location. Scores of pupils learned to fly there.

New Swallow Agents

The Swallow Airplane Manufacturing Co., of Wichita, Kans., has concluded arrangements with the following who will act as sales agents for the New Swallow line of commercial planes: Victor Dallin, Philadelphia, Penna.; G. V. Aerial Transportation, Inc., Bartlesville, Okla.; Phillips & Bowman, 54 N. Yorktown St., Tulsa, Okla.

Wright Aero Corp. Dividend

The board of directors of the Wright Aeronautical Corp. of Paterson, N. J., have declared a dividend of 25 per cent per share on the outstanding capital stock of the corporation, payable Nov. 29, 1924.

Farman Wins Lamblin Cup

The Farman four-motored Jabiru monoplane equipped with 180 hp. Hispano Suiza motors, has just become the holder of the Coupe Lamblin, making an average speed of 113 m./hr. for the entire course.

Philadelphia News

By C. T. Ludington

The meeting on Nov. 2 of Pitcairn Field at Bryn Athyn, Pa., under the auspices of the Aero Club of Pennsylvania was an outstanding success. So many persons made their way to the Field that the roads were choked and many motorists in spite of excellent traffic regulations could not get within two miles of the airdrome. The crowd of about 20,000 appeared to be well pleased with the first class exhibition put on by Capt. Charles Nungesser and his comrades, Lieuts. André Pillet and Maurice Weiss. An exhibition in a VE7 by Lieut. Ralph A. Ofstie of the Navy was well received.

The formal dedication was performed by W. Wallace Kellett, president of the Aero Club of Pennsylvania, who in a short speech outlined the work of the Club in the past, its steadily increasing activities in the present, and the part it expects to play in the future in actual flying activities in and around Philadelphia. He praised the facilities created by the practical enthusiasm of Harold Pitcairn and painted a bright picture of this city's aerial future.

There was no loss of time between the end of Kellett's speech and the commencement of the flying program. Immediately after the dedication ceremony was over, three Orioles of Pitcairn's fleet took the air and while circling the field dropped showers of roses on the crowd.

The three visiting Frenchmen were then formally presented to the crowd from the back seat of a touring car and were given a tremendous ovation. While the applause was still going on, Lieutenant Ofstie took off in his Vought and gave a very fine performance. This was followed by a truly marvelous exhibition of acrobatic flying by Weiss in the Anzani-engined Potez "Sport". The extreme maneuverability of this little French ship was interesting to watch, to say nothing of the exceptional skill of its pilot. The ability of the Potez to loop cleanly with no preparatory dive and but little loss of altitude is amazing considering its substantial construction and comparatively low power.

The spectators had a treat when Nungesser in a Hanriot and Weiss in a Nieuport engaged in an aerial battle. The concealed machine gun in a pit over the side of the hill was fairly effective and when Nungesser got on Weiss' tail and the latter appeared to come down in flames after a partial recovery of control the crowd had "more fan than a goat fight" as one onlooker was heard to remark.

Lieut. George A. Pond from Mitchel Field demonstrated the capabilities of the Cox-Klemin training plane to everyone's satisfaction and then the wind came—and it came! The lighter ships on the field were hurriedly rushed into the capacious hangar and the spectators watched with some anxiety the landings of such ships as were caught in the air. All came down safely, including those visiting ships which had just started for home. Nungesser, to show what could be done, took off in his Hanriot and gaily stunted at a thousand feet while those on the ground chased their hats—to the crowd at least an impressive performance.

Among the visitors, besides those mentioned above, were Capt. Hugo Drayton with a DH from Mitchel Field, Lieut. C. H. Schildhauer in a DH from the Navy Yard and Lieutenant Kyle of the Navy in a Vought. Robert P. Hewitt in the Special Sport Farman, resplendent with "aluminized" wings and prop and Renold Gilkes in a Jennie dropped in from Pine Valley.

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The performences of the ships from Essington in the Baltimore handicap race was described in the last issue of AVIATION. Frank Mills' hasty trip to Philadelphia for a strut was characteristic of his ability to get things done in a hurry.

• • •

Victor Dallin is now in Wichita, Kan., preparing to bring back his new Swallow.

Renold Gilkes has been putting in a lot of time on the Jersey lo shores with C. T. Ludington at Pine Valley.

Robert Hewitt has been doing effective advertising work for the Dupont Motor Co. with Dallin's Cannack and more recently with the Ludington Exhibition Co.'s new Farman. With this latter ship he carried out a flight of 150 or more miles, starting from Wilmington, and dropping newspapers telling election results over towns in Delaware which otherwise would not have received them until much later in the day. This trip was completed in spite of a high wind, the last forty miles down wind being covered in fifteen minutes.

Members of the Aero Club of Pennsylvania attended on Nov. 5, at Collingswood, N. J., the funeral of Bradford Hoffman Tyre, who died on Nov. 2, of an infection following an operation made necessary by injuries received when the ship he was flying crashed at Vineland, N. J.

New Metal Monoplane

A new metal monoplane, built at home by W. H. A. Boyd as designer, and his father, W. B. Boyd, in Baltimore, is being tested at Logan Field by Lieut. Leo M. Willinger.

New all-metal monoplane, built by W. H. A. and W. B. Boyd at Baltimore.

The ship is built entirely of duraluminn and the wings can be folded back for storage purposes. For the present a 10 hp. radial engine is mounted, but a more powerful engine will be required to carry the load of pilot and two passengers for whom accommodations are provided. The span of the ship is 30 ft. and the weight empty 800 lb.

British Air Lines' Safety Record

Only six deaths have been recorded in the last five years of English commercial aviation out of more than 50,000 passengers carried during that time and about 4,000,000 mi. flown.

The English commercial air services have had a remarkable growth, starting with a total of twenty passengers for 1919 and steadily increasing. Most of the passenger service was done between London and Paris, where six trips are now made daily. The routes to Berlin, Moscow and Cologne are now being operated daily and carry on the average of two passengers. The freight capacity of the planes is usually taken several days in advance.

The Imperial Airways, the national syndicate, is preparing to add 3,000 mi. daily service to the 1,660 mi. it now operates. The new routes include Zurich-Rome and Paris-Madrid.

The price of air traveling has been reduced from 10 to 7 cents a mile.

Votes by Air Mail

Two ballots from absentee voters were received by air mail at the Board of Elections office in the Municipal Building, New York. One was from Henry A. Wise of 18 East Seventy-third Street and was postmarked 3 p. m., Oct. 27, at Los Angeles, Calif. The other, from Charles S. Murray of 861 East Twenty-first Street, Brooklyn, was mailed in Dubuque, Iowa. Each envelope carried 48 cents' worth of stamps, and each arrived shortly before the time limit for absentee voters to get their ballots to the Board of Elections.

Japanese World Flight Proposed

The Japanese Imperial Aviation Society has proposed flights by Japanese aviators next year across the Pacific, from Japan to London and possibly around the world. Yukitsuna Sanada, now residing at Oakland, Calif., will attempt the flight from the Pacific Coast of North America, via Hawaii and Midway Island to Japan next May.

The flight from Tokio to London, via India, which may be extended to a world trip, will start in the spring.

UNITED STATES AIR FORCES

U. S. ARMY AIR SERVICE

Activities at Ross Field

On Oct 19, the following Reserve Corps military instruction began at Ross Field, Arcadia, Calif:

Elementary military law—Following the official correspondence course authorized by the War Department. A splendid group of officers with an excellent instructor. The presentation of this subject was such that every member of the class comprehended every point made by the teacher.

Engineering—Organization effected along lines outlined by Colonel Jackson, 9th Corps Area, Presidio of San Francisco. The instructor is Capt. C. J. Yeager, Eng., O.R.C.

Infantry tactics (advanced)—Organization of a class in advanced infantry tactics was perfected under Maj. E. W. Tucker, Inf. O.R.C.

Camouflage (Engineers)—The 40th Engineers, Camouflage, Company F, are to be under the instruction of Lieut. Ernest F. Bishop, Eng. O.R.C., in organizing a class by direction of the War Department.

Junior Quartermaster Instruction—A class is being organized by a Reserve Quartermaster in the elements directly connected with the Corps.

The Commanding Officer of Ross Field, Lieut. C. P. Kane, A.S., is planning further extensions of the work at his Field and it bids fair to rival more ambitious posts with a personnel ten times as large.

Ford A. Carpenter, manager of this department as Major, Staff Specialist, O.R.C., is delivering a series of lectures, open to the public, on various topics related to aeronautical meteorology. Officers from Clover Field were in attendance at a recent lecture at Millspaugh Hall, Southern Branch of the University of California, and it is planned to have several air officers take this course the same as has been done during the past six years at these lectures on applied meteorology.

Lieut. Doolittle Does Much Flying

Lieut. James Doolittle, one of the test pilots of McCook Field, is one of the most active pilots in the Air Service. For the month of August his flying time was 150 hr. 22 min. This was all bona fide time with many different types of airplanes. Some of it was at altitudes of over 20,000 ft., some over the roughest terrain in the United States, and some in experimental test flying at night. It included a photographic trip, taking in an area comprising Dayton, Seattle, San Diego, Denver, San Antonio and Washington, D. C., and a Pulitzer Race Propaganda flight, including in one day the cities of Dayton, Toledo, Detroit, Chicago, St. Louis, Memphis, Nashville, Louisville, Cincinnati and Springfield, Ohio, a distance of over 1550 mi. These flights were taken with no other pilot or student in the plane. Lieutenant Doolittle has averaged over 100 hr. per month for the last three months.

Reserve Officers Train at Fort Bliss, Tex.

A training camp for Air Service reserve officers was held Aug. 1 to 15 at Fort Bliss, El Paso, Tex., with the following officers participating: Lieuts. Cecil H. Braddock, William J. Foy, Fred E. D'Amour, Robert A. Officer, Carl C. Alford, Orville P. Willoughby, Ralph J. Hall, Cecil W. Macy, Samuel L. S. Thorpe, all of Denver, Colo.; Maj. Richards D. Gile, Colorado Springs, Colo.; Lieuts. Paul S. Greene, Douglas, Ariz.; Archibald R. Jones, Pueblo, Colo.; James W. Greeg, Como, Col.; Charles B. Cheese, Peyton, Colo.; Shurtey H. King, East Vaughn, N. M.; Wm. B. LeBreton, Alamogoedo, N. M. Also Private John C. Crowell, Enlisted Reserve Corps, Denver, Colo. Lieutenants Greene and Cheese arrived at Fort Bliss on July 31 and started training the next day.

Reserve Officers' Regulations Revised by War Department

The regulations for reserve officers, which the War Department has been revising for the past eighteen months, will be published within a few weeks. The principal changes are in promotion, training and appointment of general officers. An Auxiliary Section of the Officers' Reserve Corps is created wherein reserve officers who would otherwise be retired for age or disability will be retained as members of the Army of the United States.

The new regulations in regard to promotion provide that there must be a vacancy to which the reserve officer can be assigned before he may be promoted. The War Department is now determining the officer qualifications for all grades and branches in the military service. When the reserve officer has passed the required examinations and completed the necessary work to meet the qualifications specified, he will be given a certificate of capacity for promotion, but will not be promoted until an actual vacancy exists for him in the Army of the United States. Under the old regulations a reserve officer was required to serve a specified time in each grade. The new regulations retain this principle, but the time to be served is varied for each grade in accordance with a scientific system of promotion, which will operate to produce the proper proportion of officers in all grades.

Another interesting special feature of the promotion regulations is that World War officers of mature age need not serve the full specified time in a grade. As an example, a major 45 years of age will not be called upon to serve three years as a major, if he is able to complete the work required and pass the examination for a certificate of capacity to be a lieutenant-colonel. He will be promoted as soon as he secures this certificate, provided a vacancy exists to which he may be assigned.

Heretofore the matter of training has varied in each Corps Area. Under the new regulations, training will be largely by Organized Reserve units, and the reserve officers in command of these will be given much greater responsibility for the training of the officers assigned to them. The War Department proposes to detail a Regular Army officer to assist each commander of a reserve regiment in making his training plans and to handle the routine work of the regimental organization.

The old regulations provided no special procedure for the appointment of reserve officers as brigadier generals and major generals. This subject is now covered in a separate regulation, as the appointment of general officers concerns not only reserve officers but all components of the Army. Under these regulations reserve officers will be appointed brigadier-generals after passing a military examination, the scope of which will be announced several months in advance. The final part of this examination will be a test in the actual command of a brigade of regular troops. An alternative system is provided in that the examination for brigadier-general may be waived if the reserve officer attends the full course at the Command and General Staff School at Fort Leavenworth. This school produced the great majority of Regular Army officers who demonstrated marked ability to command troops during the World War.

Provision also has been made in the new regulations to give full credit for service in the National Guard and the Regular Army to former officers of these components when they apply for commissions as reserve officers.

Lieut. Nelson to Wed

The engagement of Lieut. Eric Nelson, world flier, and Miss Ruth Butler of Dayton, Ohio, is announced in the *Los Angeles Times*. The wedding date was not announced.

Lieuts. V. E. Bertrandias and G. C. Macdonald, A.S., who made a new seaplane record with a Loening Air Yacht on Nov. 8.

Army Pilots Break Seaplane Record

Lieut. Victor E. Bertrandias and George C. Macdonald, A.S., flying a Loening Air Yacht, on Nov. 8 established at Hampton, Va., a new seaplane record for 1000 km. (621 mi.), flying the distance in 6 hr. 6 min. and averaging 102 mi./hr.

The former record, made by Lieutenants Weed and Price, U.S.A., was 74 mi./hr.

Mitchel Field News

Eight Martin Bombers from Langley Field, commanded by Maj. John H. Pirie, A.S., arrived at Mitchel Field on the night of Oct. 10 after having demonstrated the facility with which a base can be changed over night, and a new objective proceeded against the following morning. This maneuver was similar to the one executed last year when the objective was Bangor, Me., with the exception that this year the first leg of the flight was made in darkness.

A strong head wind was encountered. The planes, by aid of their own parachute flares, landed without difficulty. The following morning, after circling New York City for an hour, the Bombers went on to Hartford, returning to Mitchel Field in the afternoon and leaving for Langley Field the following morning. A ninth Bomber, piloted by Capt. E. W. Duncan, was forced down for minor repairs at Lakehurst on the trip up from Langley Field and joined the main flight the following morning at Mitchel Field.

Capt. H. W. McClelland, Signal Officer at Mitchel Field, operated a receiving and transmitting set from Major Pirie's plane which was forced down at Cape May for a few minutes, and gave up radio fans along the Atlantic Coast considerable excitement. His calls for weather reports from Lakehurst, Camp Vail and Mitchel Field were interpreted to mean that he was lost, with the result that Mitchel Field was deluged with telephone calls volunteering assistance. It demonstrated a keen interest and a real spirit of cooperation on the part of the public as many of the calls came from distant points.

Reserve Officers Training Camp at Post Field

This year's training camp for the Air Service Reserve Officers at Post Field, Okla., was a distinct credit to the Army and probably one of the best in the country. Such is the consensus of opinion of the thirty-three reserve fliers who attended the course. There were 332 hr. 45 min. chalked up to the credit of the reserve officers alone. In addition, there were approximately 200 hr. gained by the Regular Army instructors during the two weeks' course.

Training commenced Aug. 17 and ended, officially, Aug. 31. In that time almost thirty cross-country flights were made by the fliers, including hops to Dallas, Kelly Field, Tulsa, Oklahoma City, Holdenville, Chaton, Bartlesville, McAlester and a number of other Oklahoma towns and cities.

Nearly all the officers, with the exception of the five observers in the group and those who failed to pass their physical examinations, were soloed, and of these about five gained the rank of "Instructor." There were no serious accidents. One officer cracked up as he landed from a cross-country flight to Dallas, another taxied into a ship on the line and another suffered a broken tooth and split chin, involuntarily biting an oblique camera while on a mission in the air.

Kelly Field Fliers Give Gunnery Demonstration

On Oct. 1 personnel from the 10th School Group, Kelly Field, Tex., consisting of 61 officers and enlisted men, gave a demonstration of Air Force gunnery and bomb dropping at Fort Leavenworth, Kan., before the present class of the Command and General Staff School. This demonstration has come to be an annual event and is for the purpose of illustrating the technic of firing machine guns from pursuit and attack planes at ground targets, and the use of bombs by Attack, Bombardment and Pursuit units of the Air Service.

Good fortune favored the event. The weather was ideal and a large crowd, not only of the student officers but other military and civilian spectators as well, witnessed the excellent work of the pilots, gunners and bombers. The Pursuit and Attack units simulated action from low altitudes against convoys, bridges and railroads, and their accuracy was perfect. The bombardment flight of four Martin Bombers dropped 100 lb. bombs from 6,000 ft. on a target representing a factory or industrial center, and in salvo from 3,000 ft. against similar targets. The results were more than satisfactory.

U. S. NAVAL AVIATION

CS Squadron to Cross Continent

A transcontinental flight from Hampton Roads to San Diego will be made next month by the new CS squadron of combination land and seaplanes now at the Eastern naval air base. This squadron has engaged for several months in experimental flights from the aircraft carrier Langley, now on its way from Hampton Roads.

The CS type, equipped with 575 hp. Wright engines, were intended for use by the navy in a flight around the world. When that project was given up it was planned to use one of them in meteorological work in the Bering Sea and off the Alaskan coast.

The plan also was discarded, and except for a few endurance tests on the Atlantic coast the planes have not had a real test in long distance cruising.

A flight from San Diego to Hawaii by the squadron of seaplanes which will take part in the battle maneuvers off the Hawaiian coast next March is being considered, navy officers said.

Naval Air Orders

Lieut. Charles G. Halpine and Lieut. Douglas A. Powell, det. VO Sqd. 2, Aircraft Sqd., Bat. Flt. by Comdr. Aircraft Sqd. Battle Flt.; VO Sqd. One approved.

Lieut. Ray E. Snedaker (SC), det. Torp. and Bombing Plane Sqd. One, Hampton Rds., Va., to Torp. and Bombing Plane Sqd. One, Hampton Rds. Va., connection settlement of accounts.

Lieut. William H. Burtis, to duty exec. off. U.S.S. Patoka.

Lieut. George R. Henderson, det. Aircraft Sqd. Sctg. Flt.; to Nav. Air Sta., Anacostia, D. C.

Lt. Comdr. Cecil Y. Johnston, det. U.S.S. Wright; to Aircraft Sqd. Sctg. Flt.

Lt. Comdr. Glenn B. Strickland, det. Nav. Air Sta., N.O.B., Hampton Rds., Va.; to U.S.S. Wright involving flying.

Lieut. James D. Barner, det. Aircraft Sqd., Battle Flt.; to Nav. Air Sta., Anacostia, D. C.

BACKFIRES

Some day a pilot with literary ability will spring upon the unsuspecting reading public an autobiography under some such title as "Cows I Have Met and Cows That Met Me" or "Zooming Over the Bovine Species" or "Karl Gewitterzerschmetterer's Curious Tales of Planes and Cows."

For cows are almost the only mammals outside the human species that seem to take any interest in airplanes. You can fly over horses and scare them, but you can't get any sympathetic reaction out of them. They either run away or they ignore you. And dogs just bark at you.

But the cows, ah, the cows. They are a different proposition altogether. You fly over a herd and they appear non committal. But it's a sham. All the time, while they seem to be placidly ruminating, they look at you out of the corner of the eye. And if you start cutting up, you will see the cow's curiosity get the better of her dignity. Imperceptibly she will raise her head and follow the evolutions of the plane. And if you should make a steep slumbing turn and follow it up by throwing the ship over on the opposite wing, the cow will bank her head until her vertebrae will nearly snap. For a cow if properly coaxed, can't resist the appeal of stunting.

But it is toward planes on the ground that cows display the most vivid interest. Witness the case of the Brooks Field pilot who was overdue until his commanding officer was about to send out a search party, when the following telegram came in: "Delayed by cow eating wing. Home tomorrow."

Or take the experience of the gypsy flier who, in order to carry a particularly heavy passenger, had to drain part of his gasoline into a large bucket that happened to be standing on the improvised flying field. No sooner had he taken off than a cow who had watched the proceedings with dignified restraint drained the bucket to the last drop. And when the barnstormer landed he was confronted by an irate farmer who claimed $400 for his dead cow. And as the pilot would not pay the bill claiming that the cow had acted within the inalienable rights of the bovine species, the farmer had him put in the hoosegow. And when the judge found that the intrepid birdman could not make good the farmer's loss, he confiscated his plane and the pilot took the train to the nearest place where jennies are hatched.

Yes, some day we shall have a wonderful book of true stories about cows and planes. And some day the Department of Agriculture and the governmental bureau in charge of civilian aviation will appoint a Joint Board to Draw up Regulations for the Conduct of Cows in the Presence of Unattended Airplanes.

ONE WING LOW

Where to Fly

CALIFORNIA
Learn to Fly in San Diego—The City of a Thousand Planes
THE RYAN SCHOOL OF AVIATION
Offers ideal flying conditions all seasons. First class facilities and equipment. Opportunity to study latest type planes and construction. Complete flying and ground course at reduced rates for a limited time

CALIFORNIA
VARNEY FLYING SCHOOL
Established since 1914
SAN MATEO SAN FRANCISCO

ILLINOIS
HEATH AIRPLANE COMPANY, Inc
Oldest commercial establishment in U S
Airplane Supplies Flying School
2856 Broadway Chicago

ILLINOIS
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Publisher's News Letter

The election of President Coolidge will have a very direct influence on the future of our national aviation policy. Probably the full significance of the election has not been realized by those who have the interest of aviation at heart. The possibilities of what might have happened can be considered without letting any partisanship influence enter into the picture. A change at this time would have created uncertainties that would have put off consideration of vital aeronautical problems for a year at least as the new Congress does not assemble until December, 1925. Then, too, the tendencies of Senator La Follette and of Mr. Davis in the direction of a strong air force are not known, so that from a purely negative point of view the continuation of the present administration will at least stabilize the situation.

* * * *

From a positive view there can be nothing but congratulatory emotions. That the business condition will become better has been indicated immediately. With the certainty of a known program for four years, business will now be able to make its plans for the next few years. This will have a very helpful influence on the aeronautical industry for it will mean that capital will feel freer to consider this field as an investment proposition. With business in a thriving condition, the tendency toward progress in the field of commercial aeronautics is inevitable. New uses for aircraft will be tried out that would not be undertaken if there were the possibility of an economic depression on the horizon. Viewed entirely from the angle of advancing commercial aviation, the election holds a promise of prosperity that cannot be denied.

* * * *

By far the greater stimulus to aviation will come in the governmental field. President Coolidge has stated in unmistakable terms his impartial interest in the aircraft problems of the service. He wants to know whether the battleship is still as much a factor in naval warfare as it was before the development of aircraft. He, also, doubtless will want to know whether we are getting the maximum results from the expenditures we are making for our aerial defense. Out of all this investigating interest shown by the President there must come some definite policy that will give a progressive development that has been lacking in the past. For these reasons the election must cheer everyone who has even the slightest knowledge of the critical condition in which aviation in this country finds itself at present.

* * * *

The *New York World* has followed the election period of crowded news columns by an expose of our air services that will make aviation history. Mr. Ralph Pulitzer was at the Dayton races and evidently what he saw convinced him that something was radically wrong with our government aeronautical progress. The series which AVIATION hopes to reprint in full gives substantial confirmation of all the criticism that has been made about excessive costs, duplication, uncertainty of figures, and a general aimless wandering by the services. As these articles will appear throughout the country in other papers the effect will be strongly toward a change in policy or better still, will bring about some definite national policy.

* * * *

At the same time there will appear a series of articles in the Hearst papers by Charles Grey, Editor of *The Aeroplane*. These articles will deal with American aeronautical problems from all sides in popular style. Mr. Grey has also sent AVIATION a series of articles on American Aviation that will be of great interest to our readers. Not only do they come from the pen of a writer whose style is incisive and brilliant, but also from one who has taken such a personal interest in American aeronautical progress that he is better informed in many particulars than those who are so close to our problems that they cannot view the situation in its entirety. As Mr. Grey is also the Editor of "All the World's Aircraft" he has a world wide viewpoint that gives his writings the range of a view seen through a very wide angle lens.

Frank, open discussion is needed at this time. With *The World* and its allied papers, and the Hearst group under the editorial direction of Arthur Brisbane giving the whole problem of aviation their best editorial attention, the time seems ripe for a forward movement by the aeronautical thin front line. Heretofore aviation has seemed to be on the defensive. Now it is not only undertaking an offensive but by cold facts has placed the obstructionists on the defensive.—L. D. G.

A Suggested National Air Policy

That a National Aviation Policy is needed by the United States is obvious. To get such a policy in concrete form AVIATION *requested several thoughtful friends of aeronautical progress to make suggestive and constructive recommendations. Some of them are given below and will be printed each week with additions, omissions and such other changes as appear to be helpful toward the formulation of a sound national air policy. Readers of* AVIATION *and others can render no greater service to the cause of aeronautical progress than contributing their comments and suggestions.*

GOVERNMENTAL.

A continuing program of aircraft development both governmental and commercial.
A civilian, charged with championing a national air policy, is needed in the Government. **Cabinet*
Aircraft committees in the House and Senate to hold aircraft hearings where civilians as well as government officials can express their opinions. **composed of fliers*
A detailed aircraft budget for all Governmental Departments, and an annual statement of all expenditures.
An experienced staff of flying officers at the head of all governmental air defense services.
Coordination of all procurement and experimental aircraft work of the government under one agency.
**Co-ordination of the aircraft experimental development of the government leaving procurement to the various branches themselves.*
Limitation of government manufacture to repair of aircraft and specialized work that cannot be done by private firms. **No limitation on experimental construction.*
The elimination of the duplication of aerial functions and facilities by government departments.
A country wide Air Mail system of trunk lines connecting the principal cities of the country. **Retirement law for air mail pilots.*
Establishment of a National Airway System through cooperation of the Federal Government with States and Cities. **A landing field in every large city.*
A national aircraft law that will regulate aviation, administered by practical pilots and experienced aeronautical engineers. **and federal air police.*
Membership of the United States in the International Convention for Air Navigation.
**Increased governmental appropriations for aerial development.*
**Encouragement of aviation rather than subsidy.*

COMMERCIAL AIRCRAFT OPERATION.

Creation of commercial air lines by private enterprise or government subsidy.
Encouragement of participation by private companies in aircraft races and competitions.
Encouragement of the training of pilots by civilian schools.
Creating an Esprit de Corps among flying men all over the country by frequent gatherings at aviation meets.
**Encouragement of safe and sane flying.*
**A continuing organization, including representatives of all important points of view in aeronautics, for the discussion of standards for aeronautics where standardization is desirable.*

INDUSTRIAL AIRCRAFT CONSTRUCTION.

Recognition that a sound aeronautical industry is a prime necessity of our National Defense.
An active industrial association that will coordinate the aircraft industry and defend it from attack.
Encouragement of the designing of new types of aircraft by manufacturers by allowing them to retain their proprietory rights.
Concentration of manufacturing firms on specialized types of army and navy aircraft. **When production demands are heavy.*
Encouragement of research by constructors, universities and other agencies as well as by the government.
Encouragement of an annual design competition for commercial aircraft.

CIVILIAN.

A national aeronautical organization composed of public spirited citizens that will take a strong position of leadership on national aeronautical policy. **Unification of all aeronautical organizations into one national association with chapters in all cities and towns.*
An Annual Aviation Week during which the country will think of aerial progress. **52 such weeks.*
The formation of local aero clubs by fliers for the purpose of stimulating flying in all localities.
Encouraging the public to fly and patronize the air mail and transport facilities.
**The encouragement of gliding and soaring contests, especially interscholastic.*

* Suggested changes.

The Aircraft Service Directory

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